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ABSTRACT

A study was conducted to determine whether group relaxation training combined with guided fantasy as a method of covert cognitive rehearsal would be more effective than story-listening or no special treatment in enabling "problematic" children to decrease muscle tension, activity level, and behavior problems and to increase academic performance and self-esteem. A total of 62 fourth graders identified by their teachers as being problematic were randomly assigned to either relaxation/covert rehearsal or story-listening (experimental groups) or to a control group. Children were evaluated before and after 6-weeks of treatment, which consisted of two group sessions per week, and again after 4 months. The control group also received relaxation/covert rehearsal training. Evaluations included teacher and parent ratings on the Conners Abbreviated Behavior Scale and the Coopersmith Self Esteem Inventory (Form B); grades in math, reading, spelling, and language arts; a spelling achievement test; classroom observations; and electromyograph measures. Only minimal evidence was obtained to suggest that relaxation/covert rehearsal and story-listening are effective in helping problematic children decrease activity levels and behavior problems and to increase academic performance and self-esteem. (MP)

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Relaxation/Covert Rehearsal for Problematic Children

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Relaxation/Covert Rehearsal for Problematic Children

Abstract

Sixty-two of the 70 most active and problematic of 162 fourth-graders, as identified by teacher ratings, were randomly assigned to relaxation/covert rehearsal, story-listening, and wait list groups. Children were evaluated before and after a six-week treatment of two group sessions per week and again four months later, after the wait list had also received relaxation/covert rehearsal training. Evaluations included teacher and parent ratings on the Conners Abbreviated Behavior Scale, Form B of the Coopersmith Self-Esteem Inventory, grades in math, reading, spelling, and language arts, a spelling achievement test, and "blind" classroom observations and electromyograph measures. Only minimal evidence was obtained for the efficacy of group relaxation/covert rehearsal, with a hint that it may be less effective than story-listening or even contraindicated for very active children. Previous reports of more positive results with individual training may be inflated due to less rigorous controls.

Relaxation/Covert Rehearsal for Problematic Children

The much-debated diagnosis of hyperactivity can be regarded as on a continuum with "normal" behavior. The Diagnostic and Statistical Manual (1980) defines it in terms of attentional deficits, excess activity, and impulsivity manifest in at least two of the following: sloppy work, noisiness, intrusiveness, difficulty waiting, low frustration tolerance, and fighting. Recent work has questioned the existence of the syndrome as a distinct entity (Lahey, Green,& Forehand, 1980; Von Isser, Quay, & Love, 1980). Cut-off points are arbitrary, and many "normal" children have at least some of the problems associated with the diagnosis to a great enough extent to interfere with their optimal development and with classroom management.

Medication and operant conditioning are the most common interventions for behavior problems in children but have disadvantages and limitations (e.g., Douglas, 1975; Safer & Allen, 1976). Methods of prevention and treatment which develop internalized self-regulatory skills seem highly desirable. Group methods which are successful with a wide continuum of problematic children are sorely needed in both clinical and educational settings.

Braud (1978) reported high levels of muscle tension associated with hyperactivity, and a large number of studies have tried relaxation training via progressive muscle relaxation (PMR) or electromyographic (EMG) feedback. Some included guided fantasy for relaxation and/or covert rehearsal. Bhatara and co-workers (1979) reviewed some of these studies with their conflicting results. They did not include, however, the only three published studies

that randomly assigned children to groups controlling for passage of time and repetition of evaluation measures as well as for experimenter attention and other nonspecific treatment effects. Only one of these three studies used group training and included covert rehearsal (Vacc & Greenleaf, 1980). It reported no significantly greater change in anxiety nor behavior ratings for emotionally handicapped children assigned to PMR or PMR with covert rehearsal than for those in quiet activities placebo or no treatment groups. Sample size was only five per group, however. Using individual training, Klein and Deffenbacher (1977) found no significant difference in impulsivity on the Continuous Performance Task nor on the Matching Familiar Figures Test (MFFT) in a PMR group than in a placebo group which played with playdough. Using individual EMG training with guided fantasy for relaxation, Rivera and Omizo (1980) did find greater improvement on the MFFT than for a placebo group which had sham EMG feedback with "small talk." This placebo may have been unconvincing and/or frustrating to the children, however. Furthermore, the MFFT posttest was administered with EMG monitoring and immediately after an EMG training session, so no evidence for generalization to other settings or behaviors was obtained nor was any follow-up reported. Also, the EMG trainer apparently administered the MFFT and hence was not blind to group membership.

In one of the less controlled studies, Putre and co-workers (1977) reported that both PMR and listening to stories reduced muscle tension in hyperactive boys with no significant difference in their efficacy. Listening to stories may be more than a placebo, however, since it could provide vicarious excitement and/or improve fantasy skills which could reduce a need for external activity

to provide stimulation. Unfortunately, Putre used no wait list to control for passage of time, experimenter attention, and habituation to the EMG measurement.

Other workers are training problematic children in self-regulation via cognitive modification by teaching self-verbalization and problem-solving techniques. This is usually done individually and not combined with relaxation training. Hobbs and co-workers (1980) reviewed the contradictory results and methodological flaws in this work.

Relaxation training may actually be contraindicated for hyperactive children due to the theory that their nervous systems may be underaroused and/or underarousable (Hastings & Barkley, 1978). This possibility and the lack of well-controlled research on relaxation, guided fantasy, and cognitive modification to support the increasing promotion and use of such programs, tapes, and biofeedback equipment led to our pilot study (Fling, Safady, Schwausch, & Wright, 1981). We randomly assigned the teacher-identified 13 most active and problematic fourth graders out of a unit of 90 to group training in relaxation/<u>covert</u> cognitive rehearsal (I), a story-listening group (II), and a wait list (III) which later received treatment I. Although few results reached statistical significance, they were quite consistently in the expected direction. Group I tended to do better than II and II better than III, which tended to worsen while "waiting" and/or do better after receiving treatment.

Our present study essentially repeated this pilot with a larger sample and minor modifications. The major purpose was to determine

if group relaxation training combined with guided fantasy for covert cognitive rehearsal is more effective than story-listening or no special treatment in enabling problematic children to decrease muscle tension, activity level, and behavior problems and increase academic performance and self-esteem.

Method

Participants

Six public school teachers in a southwestern town completed the Abbreviated Behavior Rating Scale (Conners, 1973) on their 162 fourth-graders. Of the 70 children with the worst ratings, parental consent was obtained for 62, who were then randomly assigned to relaxation/covert rehearsal (I), story-listening (II), and a wait list (III), stratifying for distribution of sexes and homeroom teachers across groups. Two children moved, leaving 20 in each of the three groups for pre-post analyses. At pretest, average age was 112 months. The 25 girls and 35 boys included 55% with Spanish surnames, 10 children in special education programs, and 4 on medication for hyperactivity. One boy on the wait list moved later, leaving 19 in this group for follow-up analyses.

Procedure

We did pre-treatment evaluation, treatment for groups I and II, and post-treatment evaluation in the fall semester. The wait group (III) received treatment I in the spring semester, followed by a third evaluation ("follow-up") four months after the second evaluation ("post").

Interventions. The two experimental groups, subdivided into four groups of ten children each, had two 30 minute sessions per

week for six weeks. Two teams (of one man and one woman each) led them. One team led a rehearsal group on Monday/Wednesday and a story group on Tuesday/Thursday while the other team led a story group on Monday/Wednesday and a rehearsal group on Tuesday/Thursday to control for meeting days and therapist characteristics. Within each subgroup, the woman and man alternated primary leadership each session.

Groups met during the last class period of the school day in the two school music rooms. Using an American Indian theme and "sign language" with one therapist modeling, children were induced to sit cross-legged at the beginning of each session on a circle of mats on the floor and then recline with eyes closed while the other therapist led the rehearsal or read the story.

The first few sessions for the relaxation/covert rehearsal groups elicited the children's awareness of changes in breathing and muscle tension that accompany "scared, nervous, uptight" feelings and led them in regulated breathing, progressive muscle relaxation, and covert positive self-talk. Imaginary trips were introduced to provide another relaxation skill and a method of quiet self-entertainment, and to develop imagery skills for later sessions. These "trips" were also designed to encourage peace with oneself and trust in life's processes by using simple nature lessons to introduce a philosophy of oneness with the universe and constancy in the midst of change. The relaxation procedures were then abbreviated to devote more time to "practicing things in your mind," such as working despite distractions, finishing tasks, delaying gratification, seeking attention appropriately, and handling neg-

ative feelings (scared, mad, and sad). We included ways to handle others' anger as well as one's own and to negotiate compromise. The fantasies identified the problem, brainstormed alternatives, evaluated consequences, and chose an appropriate behavior with positive self-talk and consequences. Well-rehearsed scripts were used and the sessions tape-recorded.

The story groups were read age-appropriate stories, such as Indian legends, fairy tales, and adventures. A bibliography is available.

The wait list was later also subdivided into two groups of 10 each with a man and woman leading each group in the relaxation/covert rehearsal treatment.

Children were encouraged to practice daily. Each child received a notebook for writing their own stories (group II) or recording experiences when practicing relaxation, imaginary trips, and/or cogritive rehearsal (group I and later, group III). Drawings could also be used for illustration. At the end of each session, leaders complimented this work and awarded a sticker (animals, flowers, etc.) on a calendar in the notebook for each daily entry.

Children were told they would receive a surprise at the end of each session if they had been still and quiet and a big surprise made of all the little ones to keep at the end of the project. Trinkets symbolizing each session's theme (I and later,III) or story (II) were given and kept in a large envelope with the child's name. At the last session, mobiles had been constructed. In only a few instances was a trinket withheld, and each time the child "earned" both it and the next one in the next session. Leaders verbally rewarded those who were still and quiet and began giving

them extra stickers (stars, happy faces, etc.).

Evaluations and instruments. At all three evaluations, teachers completed the Conners scale and also sent and received in sealed envelopes the Conners scale for the parents' ratings. This scale, cited above in selecting participants, is reported to be the most widely used teacher rating scale for hyperactivity (Rivera & Omizo, 1980) with good reliability and validity (Zentall & Barack, 1980).

Using an Autogen 1700 Electromyograph (EMG) and a hand-built electronic timing device, two teams (a woman and a man each) did individual EMG evaluations in a small room at the school. With a rehearsed script for standardization, they explained the equipment and procedures in simple, reassuring terms as they attached electrodes to the frontalis muscle and to the preferred writing forearm resting on an armdesk chair. They had the child tense and relax the forehead and arm and wiggle the fingers to demonstrate the meter and sound fluctuations and be sure they understood the concept of muscle relaxation. With the sound off and the meter blocked from the child's view, they then recorded electrical potential in microvolts, averaged over two, two-minute intervals (alternating the order of forearm and forehead for every other child) under each of three conditions: "relaxing as much as you can" (baseline), "staying as relaxed as you can and counting aloud by threes" (stress), and " relaxing again as much as you can" (recovery from stress). The team explained the stress task until the child could demonstrate adequate understanding and showed how counting on the fingers would interfere with forearm relaxation.

Five assistants each observed 12 children in their regular classrooms. Sitting quietly in the room for the first five minutes

of each observation period to accustom the class to their presence, the observer then recorded every 15 seconds for 10 minutes (40 observations) whether or not the child's behavior was "appropriate" (consistent with the task assigned by the teacher for that time). Each child was observed on three days at different times of the day. Percentage appropriate behavior out of these 120 observations on each child was obtained.

A man and woman team gave the Coopersmith (1967, 1975) Self-Esteem Inventory, Form B, Revised Short Form, to four groups of 15 children each. At the second (post) evaluation only, they also gave the Spelling portion of an achievement test, the California Comprehensive Test of Basic Skills, Form S, Level 1 (1971). The children's national percentile scores were available on this same test administered by teachers at the end of the spring (follow-up) and from the end of the previous year (pre).

Grades in math, reading, spelling, and language arts were obtained for three nine-week report periods. Unfortunately, the first period ("pre") ended half-way through treatment of groups I and II. The second period ("post") ended six weeks after their treatment and before the wait list received treatment. The third period ("follow-up") overlapped with the wait group's six-week treatment, ending three weeks thereafter. We let A+ = 98, A = 95, A- = 92, etc.

Self-esteem, class observation, and EMG measures were done at post and follow-up evaluations in the same manner and, as much as schedules allowed, at the same day of the week and time of day by the same assistants as at pretest. The five classroom observers trained before all three evaluations to a 90-95% interrater reliability.

Self-esteem, class observation, and EMG assistants were all blind to the children's group assignment and were asked not to discuss the children with teachers, therapists, nor each other. Because of their busyness and the confusion of our taking children from classes on alternating days and times, teachers seemed uncertain of group assignment.

Results

Statistical analyses. ANOCOVA were performed on posttest means with pretest scores as covariates and on follow-up means with posttest scores as covariates. Correlated *t*-tests were performed for the significance of changes from pre to posttesting and from post to follow-up. To study concurrent validity, Pearson correlation coefficients were obtained at pre and posttest for all combinations of teacher and parent ratings, classroom observations, self-esteem, and the six EMG measures. Two-tailed tests were used for all statistics.

Check for confounds. ANOVA revealed no significant difference across groups in age nor in the number of reported home practice sessions (which averaged 10.0 per child over the six weeks' training period). Chi square analyses revealed no significant differences across groups in homeroom teachers, sex, race, number in special education programs, nor number on medication for hyperactivity.

Activity level and behavior problems. At posttest, all three groups had improved significantly on classroom observations ($p < .004$). Only group I improved significantly on teacher ratings ($p < .02$) and approached a significant improvement on parent ratings ($p < .07$). This group then had the best teacher and parent ratings but the worst classroom observations of the three groups, although the

differences were not significant.

From post to follow-up, all three groups worsened significantly on classroom observations ($p < .04$). On teacher ratings, I and III worsened nonsignificantly while II improved nonsignificantly. On parent ratings, Group I worsened nonsignificantly while II and III continued to improve. On all three measures at this time, Group I was worse than II and III worse than II but not significantly.

Self-esteem. At posttest, the difference across groups approached significance ($p < .08$) with I > II > III. Groups I and II had improved nonsignificantly, while a decrease in self-esteem for III approached significance ($p < .06$). After receiving treatment I, group III reversed this worsening trend and improved. The order of self-esteem at follow-up was II > III > I, a nonsignificant difference.

Forearm muscle tension. At posttest, the difference across groups on baseline tension approached significance ($p < .09$) with III < II < I, group III having decreased tension ($p < .02$) while I and II increased nonsignificantly. Similarly, on recovery-from-stress, the difference across groups (III < I < II) was significant ($p < .02$) with I having increased tension nonsignificantly, II increasing significantly ($p < .004$), while III decreased nonsignificantly. On the stress measure, the difference across groups (III < I < II) was not significant, with tendencies in this case for I and III to decrease tension while II increased.

At follow-up, groups did not differ significantly on the three forearm measures. All three groups had decreased on all three measures with the only one of these decreases approaching significance being that for group I on the baseline measure ($p < .08$).

Frontalis muscle tension. Differences across groups were not significant at posttest nor follow-up. All three groups decreased on all three measures over both of these periods except II which increased nonsignificantly from pre to post on the recovery-from-stress measure. The only decreases which reached or approached significance were from pre to post baseline for II ($p<.07$) and III ($p<.09$) and from post to follow-up for I on stress ($p<.009$) and recovery-from-stress ($p<.07$).

Grades. At posttest, groups differed significantly on spelling ($p<.03$) and approached a significant difference on language arts ($p<.10$). For both subjects, II>I>III with groups I and II having improved while III worsened. At follow-up, groups did not differ significantly in either subject, but III had reversed its worsening trend on language arts after receiving treatment, now having the highest average while groups I and II had regressed. Groups II and III had worsened in spelling while group I continued to improve.

Groups did not differ significantly on math nor reading at posttest nor follow-up. In math, Group I improved from pre to post and then regressed by follow-up while II and III worsened over both periods. In reading, Group I improved over both periods while II and III stayed about the same.

Spelling achievement test. Groups did not differ significantly at posttest nor follow-up. All three groups improved from pre to post. From post to follow-up, I and III worsened while II continued to improve.

Concurrent validity. Teacher ratings did not correlate significantly at pre nor posttest with parent ratings, classroom ob-

servations, self-esteem, nor the six EMG measures. Parent ratings did not correlate significantly with the EMG measures. Parent ratings did correlate with self-esteem scores at pre-test (r = -.29, $p < .02$) but not at posttest, with higher parent ratings of activity level and behavior problems correlating with lower self-esteem. Parent ratings also correlated with classroom observations at pre-test (r = .18, $p < .09$) and at posttest (r = .22, $p < .05$), indicating worse parental perceptions correlating with more appropriate behavior as observed in the classroom. Classroom observations approached a significant correlation with only one other measure, that for frontalis muscle tension under the stress condition at pre-test (r = .18, $p < .10$).

Self-esteem correlated positively with five of the six muscle tension measures at pretest (ps = .008 to .06) and with the three for forearm at posttest (ps = .04 to .10).

All EMG measures correlated positively and significantly with each other. For the stress condition, the coefficients tended to be smaller (rs = .27 to .92, ps = .02 to .000) than for baseline and recovery-from-stress (rs = .64 to .95, ps = .000).

Discussion

Only minimal evidence was obtained for the efficacy of relaxation/covert rehearsal and story-listening. This was primarily in the posttreatment teacher and parent ratings and self-esteem measure and in the students' grades, none of which were completely blind. Furthermore, by follow-up, on teacher and parent ratings, classroom observations, self-esteem, the spelling achievement test, and some of the muscle tension measures, the story-listening group showed a tendency to do better than the groups that had had relax-

ation/covert rehearsal training. The potential benefits of story-listening hypothesized in our introduction and the adult attention provided thereby may actually be greater than those of the relaxation/covert rehearsal training with its implied pressure for change, especially when attempting to motivate ten problematic children in a group. Furthermore, finding children's stories which have no "moral" and therapeutic potential is difficult.

The present results were not as consistently in the expected directions as those of our pilot study. The latter may have been spurious due to small sample size, or the methods may be more effective with groups of 4 or 5 rather than 10 problematic children. Inducing them to be still and quiet for the treatment seemed much easier in the smaller groups. Also the law of initial values may have been a factor. Pretest means were worse for the pilot's sample which consisted of the most problematic 17% of a fourth grade unit than for the present sample of the worst 40%.

Our more extensive data are slightly more encouraging than the negative results of Vacc and Greenleaf (1980) and Klein and Deffenbacher (1977). The more positive results of Rivera and Omizo (1980) and those in the mixed reviews cited in our introduction may be inflated and spurious due to their less rigorous controls. Also, individual training may be more effective than group training, and the law of initial values may be a factor since their samples were more severely problematic than the present one. Furthermore, in EMG testing, we gave identical instructions to and attempted to maximally motivate control as well as experimental subjects at pretest as well as at later testings by briefly demonstrating muscle relaxation with the equipment. Especially with hyperactive children, lack of maximal motiva-

tion and identical instructions for experimental subjects at pretest and for control subjects may have biased previous studies (e.g., Braud, 1978; Rivera & Omizo, 1980).

On the 12 muscle tension measures (2 muscles under 3 conditions over 2 time periods), group III increased tension on none, group I increased nonsignificantly on two, and the story-listening group increased on four with one of these four being significant. In light of this slight evidence of increasing tension and the tendency for the story-listening group to do better than the relaxation groups on several other measures at follow-up, we emphasize the possibility that relaxation training may be contraindicated for hyperactive children due to the theory that their nervous systems may be underaroused and/or underarousable (Hastings & Barkley, 1978). Our impression was that, for a few of the more severely problematic children, lying still with eyes closed in a group appeared almost painful, at least until the guided fantasy or story-listening was underway. Hence, we recommend caution in the use of relaxation training with such children until more definitive research is reported.

A rationale for such relaxation training was provided by Braud's (1978) report of significantly higher muscle tension in hyperactive than in nonhyperactive children. We found, however, no significant correlations of any of our EMG measures with activity level and behavior problems as reported by parents, teachers, nor classroom observers.

We question the validity of some measures since few of them correlated significantly with each other. An unexpected result

was the correlation between high self-esteem and high muscle tension on 8 of the 12 coefficients calculated. Perhaps those with higher self-esteem become tense "trying" to relax.

In summary, only minimal evidence was obtained that relaxation/covert rehearsal and story-listening are effective in helping problematic children decrease activity level and behavior problems and increase academic performance and self-esteem. Some slight increases in muscle tension were found, as well as some suggestion at follow-up that story-listening was more effective than relaxation/covert rehearsal. More frequent training over a longer period and regular practice in class and at home with teacher and parent participation may be necessary. Individual training may be required for the more severely problematic children. More positive results reported in earlier studies may be spurious due to lack of placebo and wait list controls with random assignment and blind measures.

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Footnotes

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